PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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A3

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60/088,801 10 June 1998 (10.06.98) US

(63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application
US 60/088,801 (CON)
Filed on 10 June 1998 (10.06.98)

(71) Applicant *(for all designated States except US)*: BAYER CORPORATION [US/US]; 333 Coney Street, East Walpole, MA 02032 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: ENDEGE, Wilson, O. [KE/US]; 222 Normandy Drive, Norwood, MA 02062 (US). STEINMANN, Kathleen, E. [US/US]; 115 Washington Street, Unit 3B, Winchester, MA 01890 (US). ASTLE, Jon, H. [US/US]; 42 Short Street, Taunton, MA 02780 (US). BURGESS, Christopher, C. [US/US]; 97 Canton Terrace, Westwood, MA 02090 (US). BUSHNELL, Steven, E. [US/US]; 41 South Street, Medfield, MA 02052 (US). CARROLL, Eddie, III [US/US]; 24 Eddy Street, Waltham, MA 02154 (US). CATINO, Theodore, J. [US/US]; 18 Jo Paul Drive, Attleboro, MA 02702 (US). DERTI, Adnan [US/US]; 7 Wigglesworth Street, Boston, MA 02120 (US). FORD, Donna, M. [US/US]; 8 Morningside Road, Plainville, MA 02762 (US). LEWIS, Marcia, E. [US/US]; 67 Wheelwright Farm, Cohasset, MA 02025 (US). MONAHAN, John, E. [US/US]; 942 West Street, Walpole, MA 02081 (US). SCHLEGEL, Robert [US/US]; 211 Melrose Street, Auburndale, MA 02466 (US).

(74) Agents: ROESLER, Judith, A.; Bayer Corporation, 63 North Street, Medfield, MA 02052 (US) et al.

(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

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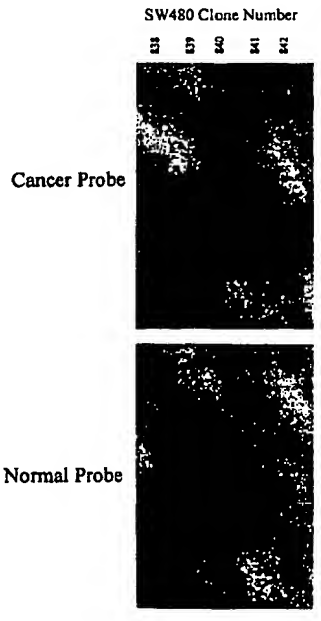
With international search report.

(88) Date of publication of the international search report:
13 April 2000 (13.04.00)

(54) Title: HUMAN GENES DIFFERENTIALLY EXPRESSED IN COLON CANCER

(57) Abstract

This invention relates to novel human genes, to proteins expressed by the genes, and to variants of the proteins. The invention also relates to diagnostic assays and therapeutic agents related to the genes and proteins, including probes, antisense constructs, and antibodies. The subject nucleic acids have been found to be differentially regulated in tumor cells, particularly colon cancer cell lines and/or tissue.



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INTERNATIONAL SEARCH REPORT

Inter onal Application No
PCT/IB 99/01062

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 C07K14/47 C12Q1/68 C07K16/18 C12N9/00 C12N15/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HILLIER L. ET AL.: "Stratagene human cDNA clone 550176 3' end;". EMBL SEQUENCE DATABASE, 30 October 1996 (1996-10-30), XP002119315 HEIDELBERG DE Accession Nr.: AA101246 ---	2,8,10
X	MARRA M. ET AL.: "Mouse cDNA clone 779685 5' end" EMBL SEQUENCE DATABASE, 14 June 1997 (1997-06-14), XP002119316 HEIDELBERG DE Accession Nr.: AA466948 ---	2,8,10
	-/--	

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 October 1999	25 Jan 2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	De Kok, A

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Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Inte ional Application No
PCT/IB 99/01062

C.(Continuation) DOCUMENT CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	SCHWEINFEST C W ET AL: "Subtraction hybridization cDNA libraries from colon carcinoma and hepatic cancer" GENE ANALYSIS TECHNIQUES, vol. 7, 1 January 1990 (1990-01-01), pages 64-70, XP002089887 ISSN: 0735-0651 page 64 ---	1,18
A	VIDER B ET AL: "Human colorectal carcinogenesis is associated with deregulation of homeobox gene expression" BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, vol. 232, no. 3, March 1997 (1997-03), pages 742-748, XP002104685 ISSN: 0006-291X page 742 ---	1
A	JAU MIN WONG ET AL: "UBIQUITIN-RIBOSOMAL PROTEIN S27A GENE OVEREXPRESSES IN HUMAN COLORECTAL CARCINOMA IS AN EARLY GROWTH RESPONSE GENE" CANCER RESEARCH, vol. 53, no. 8, 15 April 1993 (1993-04-15), pages 1916-1920, XP002024627 ISSN: 0008-5472 page 1916 ---	1
A	VAN BELZEN N ET AL: "A novel gene which is up-regulated during colon epithelial cell differentiation and down-regulated in colorectal neoplasms" LABORATORY INVESTIGATION, vol. 77, no. 1, 1 July 1997 (1997-07-01), pages 85-92, XP002089891 ISSN: 0023-6837 page 85 ---	1
A	KONDOH N ET AL.: "Differential expression of S19 ribosomal protein, laminin-binding protein, and human lymphocyte antigen class-I messenger RNAs associated with colon-carcinoma progression and differentiation" CANCER RESEARCH., vol. 52, no. 4, 15 February 1992 (1992-02-15), pages 791-796, XP002119317 BALTIMORE, US ISSN: 0008-5472 the whole document --- -/--	1

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INTERNATIONAL SEARCH REPORT

Inter ional Application No
PCT/IB 99/01062

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 95 11923 A (DANA FARBER CANCER INST INC) 4 May 1995 (1995-05-04) page 1, line 29 -page 6, line 17 page 19, line 7 -page 29, line 11 ---	1-6,9, 10,14, 17-25, 31-34
A	EP 0 284 362 A (ICI PLC) 28 September 1988 (1988-09-28) the whole document ---	1-25, 27-34
P,X	KUTAY U ET AL.: "A human homologue of yeast Mtr10p and its role in nuclear protein import" EMBL SEQUENCE DATABASE, 10 May 1999 (1999-05-10), XP002119318 HEIDELBERG DE Accession Nr.: AJ133769 abstract -----	1-6,8,10

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB 99/01062

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [ ] Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. [X] Claims Nos.: 26
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. [ ] As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. [X] No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-25, 27-34, all partially

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest.

[ ] No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 26

Claim 26, relating to an agent which alters the expression in a cell of a nucleic acid, could not be searched as its subject-matter is not disclosed

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-25, 27-34, all partially

Invention 1:

An isolated nucleic acid, comprising a nucleotide sequence which hybridizes under stringent conditions to SEQ.ID. No.1 or a sequence complemantary thereto; an isolated nucleic acid, comprising a nucleotide sequence at least 80% identical to at least 15 consecutive nucleotides of SEQ.ID. No.1 or a sequence complementary thereto; an isolated nucleic acid comprising nucleotide sequence of SEQ.ID No.1 or a sequence complementary thereto; an expression vector comprising said nucleic acids; an host cell comprising said vector; a transgenic animal having a transgene comprising said nucleic acids; a nucleic acid hybridizing to a nucleic acid probe corresponding to at least 12 consecutive nucleotides of SEQ.ID.No.1; a probe/primer hybridizing to a nucleic acid probe corresponding to at least 12 consecutive nucleotides of SEQ.ID.No.1; an isolated polypeptide encoded by said nucleic acid; an antibody that specifically binds to said polypeptide; an antisense oligonucleotide which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.1; a test kit comprising said probe/primer; a testkit comprising said antiboda; a method for determining the phenotype of a cell comprising detecting the differential expression of a nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.1 or a protein encoded by said nucleic acid; a method for determing the presence or absence of a nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.1; a method for detecting a mutation in a test nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.1; a method for identifying an agent which alters the level of expression in a cell of a nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.1; a pharmaceutical composition comprising a nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.1; a pharmaceutical composition comprising a polypeptide encoded by said nucleic acid; a method for detecting cancer using SEQ.ID.No.1 or an antibody to a protein encoded by said sequence, as a probe.

2. Claims: 1-25, 27-34, all partially

Inventions 2 to 127 :

Idem as invention 1, wherein each invention relates to the nucleic acid encoded by SEQ.ID.No. 2 to 127 in stead of SEQ.ID.No.1.

FURTHER INFORMATI N CONTINUED FROM PCT/ISA/ 210

3. Claims: 15-21, 24-26, 28-34, all partially

Invention 128:

An isolated nucleic acid, comprising a portion of a nucleotide sequence of SEQ.ID No.128 or a sequence complementary thereto; a gene which hybridizes to SEQ.ID. No.128; an isolated polypeptide encoded by said nucleic acid; an antibody that specifically binds to said polypeptide; an antisense oligonucleotide which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.128; a method for determining the phenotype of a cell comprising detecting the differential expression of a nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.128 or a protein encoded by said nucleic acid; a method for detecting a mutation in a test nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.128; a method for identifying an agent which alters the level of expression in a cell of a nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.128; a pharmaceutical composition comprising a nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.128; a pharmaceutical composition comprising a polypeptide encoded by said nucleic acid; a method for detecting cancer using SEQ.ID.No.128 or an antibody to a protein encoded by said sequence, as a probe.

4. Claims: 15-21, 24-26, 28-34, all partially

Inventions 129 to 383:

Idem as invention 128, wherein each invention relates to the nucleic acid encoded by SEQ.ID.No. 129 to 383 in stead of SEQ.ID.No.128.

5. Claims: 15-21, 25,26,28,31-34, all partially

Invention 384:

A nucleic acid hybridizing to a nucleic acid probe corresponding to at least 12 consecutive nucleic acids of SEQ.ID. No.384; an isolated polypeptide encoded by said nucleic acid; a probe/primer hybridizing to a nucleic acid probe corresponding to at least 12 consecutive nucleic acids of SEQ.ID. No.384; an antibody that specifically binds to said polypeptide; an antisense oligonucleotide which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.384; a method for

determining the phenotype of a cell comprising detecting the differential expression of a nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.384 or a protein encoded by said nucleic acid; a method for identifying an agent which alters the level of expression in a cell of a nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.384; a pharmaceutical composition comprising a nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No.384; a pharmaceutical composition comprising a polypeptide encoded by said nucleic acid; a method for detecting cancer using SEQ.ID.No.384 or an antibody to a protein encoded by said sequence, as a probe.

6. Claims: 15-21, 25,26,28,31-34, all partially

Inventions 385 to 850:

Idem as invention 384, wherein each invention relates to the nucleic acid encoded by SEQ.ID.No. 385 to 850 in stead of SEQ.ID.No.384.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte. .ional Application No
PCT/IB 99/01062

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9511923 A	04-05-1995	CA 2175380 A	04-05-1995
		EP 0725799 A	14-08-1996
		US 5889159 A	30-03-1999
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		JP 1034291 A	03-02-1989
		NO 881273 A	26-09-1988
		NZ 223985 A	28-05-1991
		PT 87055 A,B	01-04-1988

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Published
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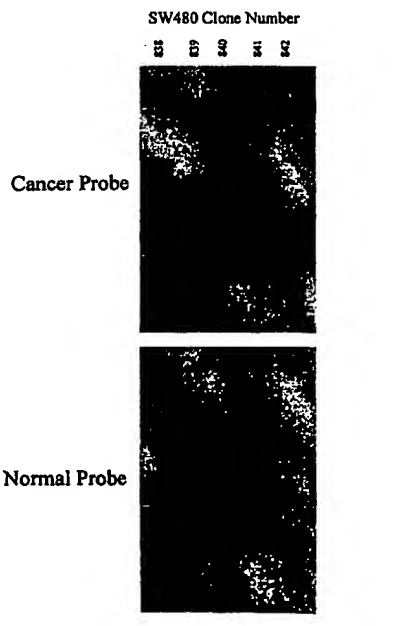
(54) Title: NOVEL HUMAN GENES AND GENE EXPRESSION PRODUCTS

(57) Abstract

This invention relates to novel human genes, to proteins expressed by the genes, and to variants of the proteins. The invention also relates to diagnostic assays and therapeutic agents related to the genes and proteins, including probes, antisense constructs, and antibodies. The subject nucleic acids have been found to be differentially regulated in tumor cells, particularly colon cancer cell lines and/or tissue.



SEQ ID NO	clone name	Cell line probe	Cancer Tissue Probes	SEQ ID NO	clone name	Cell line probe	Cancer Tissue Probes
289	SW0797M13	O	O	338	SW1065T7	O	O
290	SW0803T7	O	O	339	SW1080T7	M	M
291	SW0809T7	O	N	340	SW1085M13	M	O
292	SW0811T7	M	N	341	SW1087T7	O	O
293	SW0815M13	M	O	342	SW1091T7	O	O
294	SW0821T7	O	O	343	SW1093M13	O	O
295	SW0825T7	M	M	344	SW1097T7	O	O
296	SW0826T7	M	M	345	SW1104T7	O	O
297	SW0827M13	O	O	346	SW1105T7	O	O
298	SW0828T7	O	M	347	SW1106T7	O	O
299	SW0836T7	M	O	348	SW1107T7	O	O
300	SW0839T7	O	M	349	SW1108T7	O	O
301	SW0843M13	N	O	350	SW1109T7	O	O
302	SW0846M13	O	M	351	SW1114T7	O	O
303	SW0847T7	O	M	352	SW1123T7	O	O
304	SW0849T7	M	M	353	SW1124T7	O	O
305	SW0850T7	O	O	354	SW1130T7	M	O
306	SW0855T7	O	O	355	SW1131T7	M	O
307	SW0863T7	M	M	356	SW1132T7	M	O
308	SW0866T7	O	O	357	SW1133M13	M	O
309	SW0867T7	N	O	358	SW1134T7	O	O
310	SW0896M13	N	O	359	SW1136T7	O	N
311	SW0912T7	O	O	360	SW1141T7	M	O
312	SW0914T7	O	O	361	SW1146T7	M	O
313	SW0916T7	O	O	362	SW1147T7	O	O
314	SW0918T7	O	O	363	SW1155T7	O	N
315	SW0921T7	N	O	364	SW1156T7	O	N
316	SW0923T7	O	O	365	SW1160T7	O	N
317	SW0926M13	O	O	366	SW1161T7	O	N
318	SW0928T7	N	M	367	SW1169T7	O	N
319	SW0947T7	O	O	368	SW1176T7	O	O
320	SW0949T7	O	O	369	SW1182T7	O	O
321	SW0954T7	M	O	370	SW1193T7	O	O
322	SW0964T7	M	N	371	SW1201T7	O	O
323	SW0969T7	M	N	372	SW1203T7	O	O
324	SW0972T7	M	N	373	SW1212T7	O	M
325	SW0982T7	O	M	374	SW1213M13	O	M
326	SW0994T7	O	N	375	SW1214T7	O	N
327	SW0998T7	O	N	376	SW1218T7	O	N
328	SW1001T7	O	O	377	SW1220T7	O	N
329	SW1002T7	O	N	378	SW1232T7	O	N
330	SW1012T7	O	O	379	SW1236M13	O	N
331	SW1018T7	O	M	380	SW1238T7	O	O
332	SW1045T7	O	M	381	SW1239T7	O	O
333	SW1046T7	M	O	382	SW1245M13	M	N
334	SW1058T7	O	O	383	SW1247T7	O	O
335	SW1059M13	O	O	384	SW0003T7	O	O
336	SW1061T7	O	O	385	SW0009T7	O	O
337	SW1064T7	O	O	386	SW0012T7	O	O

We claim:

1. An isolated nucleic acid comprising a nucleotide sequence which hybridizes under stringent conditions to a sequence of SEQ ID Nos. 1-127 or a sequence complementary thereto.

2. An isolated nucleic acid comprising a nucleotide sequence at least 80% identical to a sequence corresponding to at least about 15 consecutive nucleotides of one of SEQ ID Nos. 1-127 or a sequence complementary thereto.

3. An isolated nucleic acid comprising a nucleotide sequence of SEQ ID Nos. 1-127 or a sequence complementary thereto.

4. A nucleic acid according to claim 1, further comprising a transcriptional regulatory sequence operably linked to said nucleotide sequence so as to render said nucleotide sequence suitable for use as an expression vector.

5. An expression vector, capable of replicating in at least one of a prokaryotic cell and eukaryotic cell, comprising the nucleic acid of claim 4.

6. A host cell transfected with the expression vector of claim 5.

7. A transgenic animal having a transgene of the nucleic acid of claim 1 incorporated in cells thereof, which transgene modifies the level of expression of the nucleic acid, the stability of an mRNA transcript of the nucleic acid, or the activity of the encoded product of the nucleic acid.

8. A substantially pure nucleic acid which hybridizes under stringent conditions to a nucleic acid probe corresponding to at least 12 consecutive nucleotides of one of SEQ ID Nos. 1-127 or a sequence complementary thereto.

9. A polypeptide including an amino acid sequence encoded by a nucleic acid of claim 1 or a fragment comprising at least 25 amino acids thereof.

10. A probe/primer comprising a substantially purified oligonucleotide, said oligonucleotide containing a region of nucleotide sequence which hybridizes under stringent conditions to at least 12 consecutive nucleotides of sense or antisense sequence selected from SEQ ID Nos. 1-127.

11. An array including at least 10 different probes of claim 10 attached to a solid support.

12. The probe/primer of claim 10, further comprising a label group attached thereto and able to be detected.

13. The probe/primer of claim 12, wherein said label group being selected from radioisotopes, fluorescent compounds, enzymes, and enzyme co-factors.

14. An antibody immunoreactive with a polypeptide of claim 9.

15. An antisense oligonucleotide analog which hybridizes under stringent conditions to at least 12 consecutive nucleotides of one of SEQ ID Nos. 1-850 or a sequence complementary thereto, and which is resistant to cleavage by a nuclease.

16. A test kit for determining the phenotype of transformed cells, comprising the probe/primer of claim 12, for measuring a level of a nucleic acid which hybridizes under stringent conditions to a nucleic acid of SEQ ID Nos. 1-850 in a sample of cells isolated from a patient.

17. A test kit for determining the phenotype of transformed cells, comprising an antibody specific for a protein encoded by a nucleic acid which hybridizes under stringent conditions to any one of SEQ Nos. 1-850.

18. A method of determining the phenotype of a cell, comprising detecting the differential expression, relative to a normal cell, of at least one nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-850, wherein the nucleic acid is differentially expressed by at least a factor of two.

19. A method for determining the phenotype of cells in a sample of cells from a patient, comprising:

i. providing a nucleic acid probe comprising a nucleotide sequence having at least 12 consecutive nucleotides of any of SEQ ID Nos. 1-850;

ii. obtaining a sample of cells from a patient;

iii. providing a second sample of cells substantially all of which are non-cancerous;

iv. contacting the nucleic acid probe under stringent conditions with mRNA of each of said first and second cell samples; and

v. comparing (a) the amount of hybridization of the probe with mRNA of the first cell sample, with (b) the amount of hybridization of the probe with mRNA of the second cell sample, wherein a difference of at least a factor of two in the amount of hybridization with the mRNA of the first cell sample as compared to the amount of hybridization with the mRNA of the second cell sample is indicative of the phenotype of cells in the first cell sample.

20. A method of determining the phenotype of a cell, comprising detecting the differential expression, relative to a normal cell, of at least one protein encoded by a nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-850, wherein the protein is differentially expressed by at least a factor of two.

21. The method of claim 20, wherein the level of said protein is detected in an immunoassay.

22. A method for determining the presence or absence of a nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-127 in a cell, comprising contacting the cell with a probe of claim 10.

23. A method for determining the presence of absence of a polypeptide encoded by a nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-127 in a cell, comprising contacting the cell with an antibody of claim 14.

24. A method for detecting a mutation in a test nucleic acid which hybridizes under stringent conditions to a nucleic acid of SEQ ID Nos. 1-383 or a sequence complementary thereto, comprising

i. collecting a sample of cells from a patient,

ii. isolating nucleic acid from the cells of the sample,

iii. contacting the nucleic acid sample with one or more primers which specifically hybridize to a nucleic acid sequence of SEQ ID Nos. 1-383 under conditions such that hybridization and amplification of the nucleic acid occurs, and

iv. comparing the presence, absence, or size of an amplification product to the amplification product of a normal cell.

25. A method for identifying an agent which alters the level of expression in a cell of a nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-850 or a sequence complementary thereto, comprising

i. providing a cell;

ii. treating the cell with a test agent;

iii. determining the level of expression in the cell of a nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-850 or a sequence complementary thereto; and

iv. comparing the level of expression of the nucleic acid in the treated cell with the level of expression of the nucleic acid in an

untreated cell, wherein a change in the level of expression of the nucleic acid in the treated cell relative to the level of expression of the nucleic acid in the untreated cell is indicative of an agent which alters the level of expression of the nucleic acid in a cell.

26. A pharmaceutical composition comprising an agent identified by the method of claim 25.

27. A pharmaceutical composition comprising a nucleic acid which includes a nucleotide sequence which hybridizes under stringent conditions to one of SEQ ID Nos. 1-850 or a sequence complementary thereto.

28. A pharmaceutical composition comprising a polypeptide encoded by a nucleic acid which includes a nucleotide sequence that hybridizes under stringent conditions to one of SEQ ID Nos. 1-850 or a sequence complementary thereto.

29. An isolated nucleic acid comprising a portion of a nucleotide sequence of SEQ ID Nos. 128-383 or a sequence complementary thereto.

30. A gene which hybridizes to one of SEQ ID Nos. 1-383.

31. A method for detecting cancer in which one or more of SEQ ID Nos. 1-850 are used as probes, said method comprising:

i. collecting a sample of cells from a patient,

ii. isolating nucleic acid from the cells of the sample,

iii. contacting the nucleic acid sample with one or more primers which specifically hybridize to a nucleic acid sequence of SEQ ID Nos. 1-850 under conditions such that hybridization and amplification of the nucleic acid occurs, and

iv. comparing the presence, absence, or size of an amplification product to the amplification product of a normal cell.

32. A method of claim 31 in which said cancer is colon cancer.

33. A method for detecting cancer in a patient sample in which an antibody to a protein encoded by SEQ ID Nos. 1-850 is used to react with proteins in said sample.

34. A method of claim 33 in which said cancer is colon cancer.

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